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Minimally Invasive Root Coverage in a High-Esthetic Demand Case: A Combined Tunneling and L-PRF Approach

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Introduction

Gingival recession (REC), is often associated with dentin hypersensitivity, esthetic concerns, and increased risk of non-carious cervical lesions. Among the main pathological contributors are traumatic toothbrushing[1-2] and orthodontic treatment[3-4]. In the presence of generalized recessions, particularly in patients with high esthetic expectations, surgical intervention may be indicated to restore soft tissue architecture and reduce discomfort. Among the available options, the tunneling technique offers a minimally invasive solution to enhance esthetic integration[5].

Aim

Present a clinical case of multiple gingival recessions associated with traumatic toothbrushing and prior orthodontic treatment, managed through a tunneling technique combined with connective tissue grafting and platelet-rich fibrin(L-PRF), aiming to achieve complete root coverage with optimal esthetic and biological outcomes.

Materials and Methods

A 25-year-old healthy female patient presented with multiple RCT1 gingival recessions in both arches. However, only the recessions in the first and second quadrants were selected for surgical treatment, performed in two separate phases.

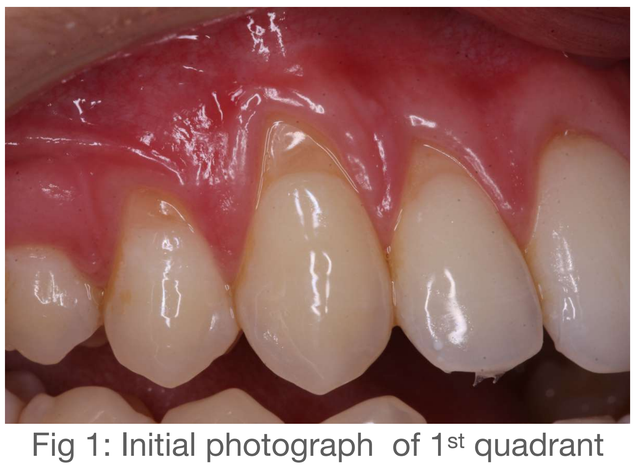

Fig 1: Initial photograph of 1st quadrant

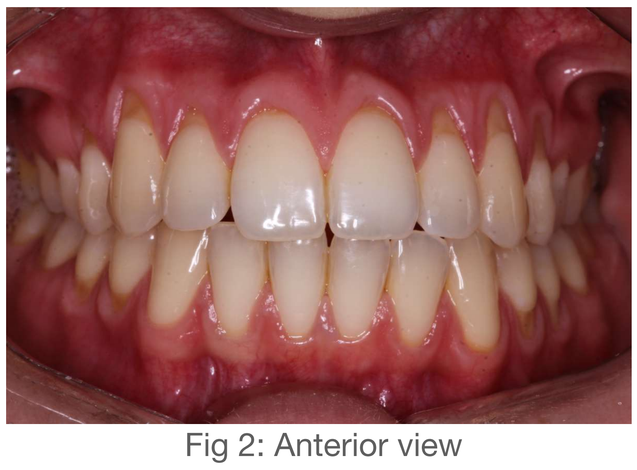

Fig 2: Anterior view

Fig 3: Initial photograph of 2nd quadrant

The connective tissue graft was harvested from the palatal mucosa and de-epithelialized extraorally before being placed into the tunnel. To promote healing and increase patient comfort, L-PRF membranes were applied to the donor site. To obtain the membrane, venipuncture was performed into 9 ml tubes, which were gently shaken to stimulate coagulation. Centrifugation was carried out at 2700 rpm for 12 minutes. The red blood cells were carefully removed, and compression of the membranes was performed for 5 minutes. One week postoperatively, the patient reported minimal discomfort, and clinical evaluation showed advanced epithelialization of the palatal wound.

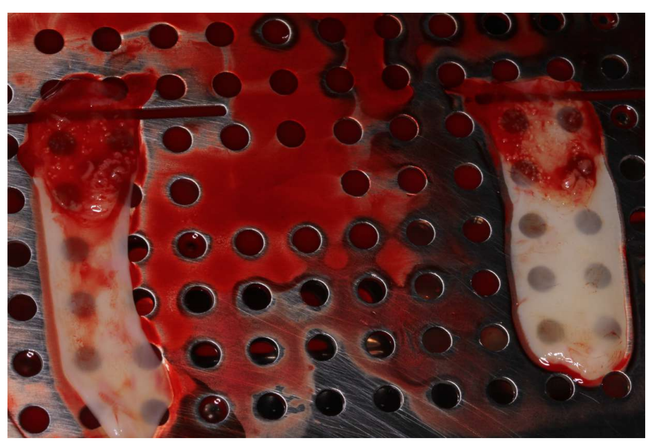

Fig 4: L-PRF membranes

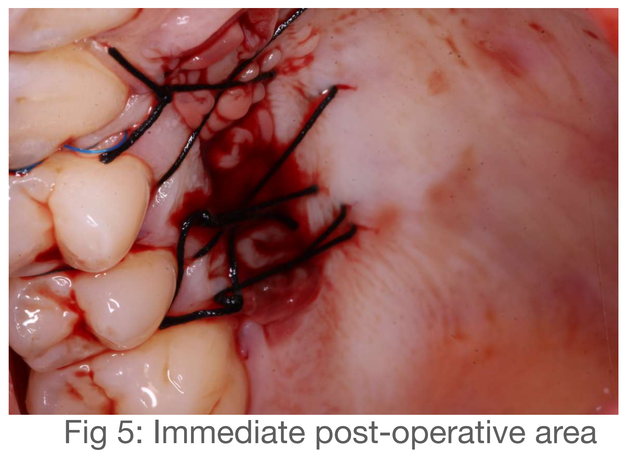

Fig 5: Immediate post-operative area of donor site

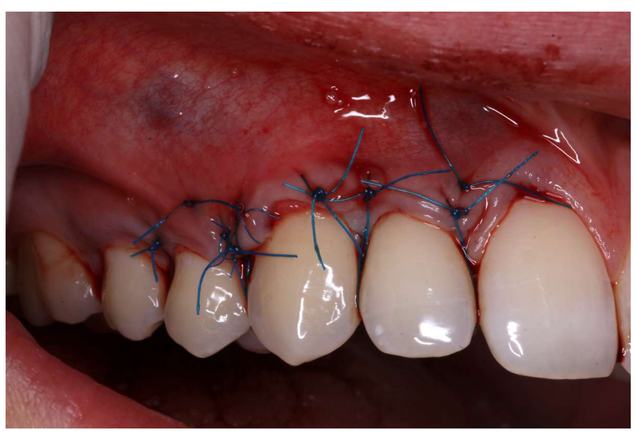

Fig 6: Immediate post-operative of 1st quadrant

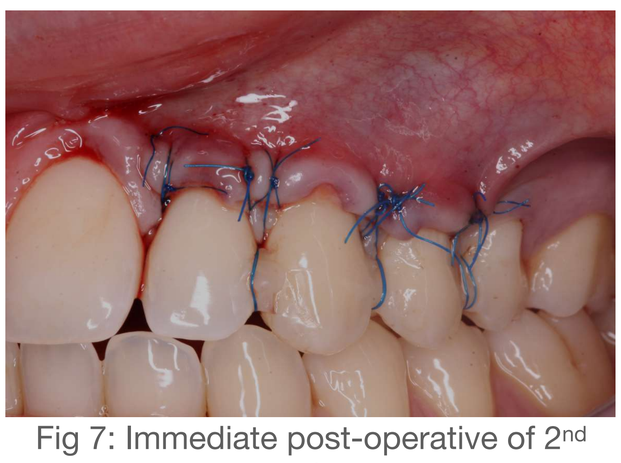

Fig 7: Immediate post-operative of 2nd quadrant

The first surgery targeted teeth 14 (REC 2mm), 13 (REC 3mm), and 12 (REC 2mm), and the second addressed teeth 22 (REC 2mm), 23 (REC 3mm), and 24 (REC 4mm). Following professional prophylaxis and reinforcement of atraumatic oral hygiene techniques, root coverage was performed using a tunneling technique based on the approach described by Zuhr et. Al[6]. A partial-thickness mucosal tunnel was created without vertical releasing incisions, allowing coronal advancement of the gingival margin and the surgical areas were stabilized using the double-cross suture technique as described by Zuhr et. Al[7].

Results

At the 6-month follow-up, complete root coverage was achieved in all treated sites, with probing depth <3mm, no bleeding on probing and with excellent graft integration and harmonious soft tissue contours. No signs of inflammation, scarring, or graft dehiscence were observed. The patient reported complete resolution of dentin hypersensitivity and high satisfaction with the esthetic outcome.

Fig 7: 6-month follow-up of 1st quadrant

Fig 7: 6-month follow-up of 2nd quadrant

Conclusion

These findings underscore the effectiveness and reliability of the tunneling technique, which successfully met both functional and esthetic objectives in the treatment of multiple recessions.

References:

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